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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,974	11/30/2001	Haruo Ichikawa	Q66892	4743

7590 10/20/2004

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EXAMINER	
FOX, CHARLES A	

ART UNIT	PAPER NUMBER
3652	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/996,974
Filing Date: November 30, 2001
Appellant(s): ICHIKAWA ET AL.

Billy Carter Raulerson
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed July 26, 2004.

This brief was filed prior to September 13, 2004 and is being treated under the rules in force at that time.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1,4,5 and 8-10 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7). Applicant arguments for this group of claim although argued separately are based on the arguments for claim1, as such claims 4,5 and 8-10 stand or fall with claim 1.

The rejection of claims 11-16 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,466,114	Swain	11-1995
4,290,734	Van Breen	09-1981
4,557,515	Read	12-1985
4,953,805	Rauh	09-1990
1,907,447	Schlitz	05-1933
JP 07-034759	Sano et al.	03-1995

(English translation attached)

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swain in view of Van Breen. In regards to claim 1 Swain US 5,466,114 teaches a method of transferring a roll comprising the steps of:

bringing a roll loading shaft into engagement with a roll retainer shaft holding a plurality of rolls;

releasing said rolls from being held on roll retaining shaft;

supporting said rolls;

moving and transporting one of said rolls along the roll retaining shaft and onto said roll loading shaft;

fixing said one roll to said roll loading shaft;

wherein releasing the rolls from the roll retaining shaft comprises the step of pressing the end of the retainer shaft by the end of the roll loading shaft to release the rolls under a pressing force.

Swain further teaches that the pressing tip of the loading shaft rotates a portion of the retaining shaft. Swain does not teach moving the rolls by the rotation of said roll

loading shaft. Van Breen US 4,290,734 teaches moving a plurality of rigid disc along a shaft by rotation of a ball screw located in the shaft. It would have been obvious to one of ordinary skill in the art, at the time of invention to modify the roll moving methods taught by Swain with the methods taught by Van Breen in order to move the rolls without needing a separate handler thereby simplifying the system by doing away with secondary handling devices.

In regards to claim 4 Swain teaches an apparatus for transferring a roll held on a supply carriage comprising:

a roll loading shaft (110) for engaging a roll retaining shaft (14) of said roll supply carriage which holds a plurality of rolls;

releasing means (24) for releasing said rolls from being held on said retaining shaft (14);

transferring means (not numbered) for moving one of said rolls onto said roll loading shaft, see column 9 lines 33-40;

fixing means for fixing said one of said rolls to said loading shaft. See column 5 lines 44-50;

wherein said releasing means has a pressing member (112) disposed at the axial center of said roll loading shaft for pressing an axial center of said roll retaining shaft, to release said rolls from said retaining shaft;

he further teaches an engaging means (112) disposed at the axial center of the loading shaft for engaging a shaft in the axial center of the retaining shaft. Swain does not teach a ball screw for moving the rolls along the retaining shaft. Van Breen teaches

moving a plurality of rigid disc along a shaft by rotation of a ball screw located in the shaft. It would have been obvious to one of ordinary skill in the art, at the time of invention to provide the roll retaining shaft taught by Swain with the roll moving device taught by Van Breen in order to move the rolls without needing a separate handler thereby simplifying the system by doing away with secondary handling devices.

Claims 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swain as applied to claim 4 above, and further in view of Rauh. In regards to claim 5 Swain teaches the limitations of claim 4 as above, he does not teach a pushing means for a support members of the loading shaft. Rauh US 4,953,805 teaches a loading shaft (12) for rolls of film where the shaft has a support member (13) for supporting the side of one of said rolls and a displacement means (18) for moving said support member along said loading shaft. It would have been obvious to one of ordinary skill in the art, at the time of invention to provide the support member as taught by Rauh on the device taught by Swain in order to allow the device to expel roll cores after the film is removed from the roll.

In regards to claim 10 Swain teaches the limitations of claim 4 as above, he does not teach the fixing means as having finger members. Rauh teaches a means for fixing a film roll to a loading shaft comprising finger members (12) that are displaceable towards an outer circumferential surface of said roll loading shaft. It would have been obvious to one of ordinary skill in the art, at the time of invention the fixing members as taught by Rauh on the device taught by Swain in order to allow the device to hold and release roll cores as needed.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swain and Van Breen as applied to claim 7 above, and further in view of Schlitz. Swain and Van Breen teach the limitations of claim 7 as above they do not teach an Oldham coupling between the loading and retaining shafts. Schlitz US 1,907,447 teach an Oldham coupling for joining two shafts, said coupling comprising:

a hub (22) rotated by a drive means (20);

a slide element (25) slidable in a direction substantially perpendicular to the longitudinal axis of the hub;

a sleeve (42) disposed around said hub and said slide element which limits the range of movement of the slide element;

said slide element engages a driven shaft to transmit the rotational motion of said drive means (20).

It would have been obvious to one of ordinary skill in the art, at the time of invention to provide an Oldham coupling as taught by Schlitz on the device taught by Swain and Van Breen in order to account for any misalignment between the loading and retaining shafts.

Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Read in view of Swain. In regards to claim 11 Read US 4,557,515 teaches a roll supply carriage comprising:

a roll retaining shaft (30) for holding a roll thereon;

fixing means (45,45a) disposed in a tip of said shaft for fixing said roll to said shaft;

a switching means (67) for retaining and releasing a roll from said retaining shaft.

Read does not teach a means of moving the roll on the retaining shaft. Swain teaches a transferring means (not numbered) for moving one of said rolls along said roll retaining shaft, see column 9 lines 33-40. It would have been obvious to one of ordinary skill in the art, at the time of invention to provide the roll transferring means taught by Swain to the device taught by Read in order to move a roll from the device without manual intervention.

In regards to claim 12 Read further teaches said fixing means has finger members displaceable towards the outer circumference of said retaining shaft.

In regards to claim 13 Read also teaches the switching mechanism comprises:

cams (57,58) for bringing said fixing members into and out of the position of holding said roll on said retaining shaft;

displacing means (63) for displacing said cams.

In regards to claim 14 Read further teaches that said displacing means is disposed on the tip of said retaining shaft and movable along said shaft to displace the cams.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Read and Swain as applied to claim 11 above, and further in view of Van Breen. Read and Swain teach the limitations of claim 11 as above, they do not teach moving the rolls from the retaining shaft with a ball screw. Van Breen teaches moving a plurality of rigid disc along a shaft by rotation of a ball screw located in the shaft. It would have been obvious to one of ordinary skill in the art, at the time of invention to provide the roll

moving device taught by Read and Swain with the roll moving device taught by Van Breen in order to move the rolls without needing a separate handler thereby simplifying the system by doing away with secondary handling devices.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Read and Swain as applied to claim 11 above, and further in view of Rauh and further in view of Sano et al. Read and Swain teach the limitations of claim 11 as above they do not teach the carriage as being a light shielded case with a labyrinth seal.

Rauh teaches a carriage for transferring rolls of film, wherein said carriage interior is shielded from ambient light. It would have been obvious to one of ordinary skill in the art, at the time of invention to provide a light shielded carriage as taught by Rauh for the device taught by Read and Swain in order to protect the light sensitive material being transferred. Rauh does not teach a labyrinth seal on said carriage.

Sano et al. JP 07034759 A teach using a labyrinth seal on the opening of a dark room in order to prevent light from entering said dark room. It would have been obvious to one of ordinary skill in the art, at the time of invention to provide the device taught by Read, Swain and Rauh with a labyrinth seal as taught by Sano et al. in order to insure that no light impinges upon the rolls as they are being moved from the carriage to a process machine.

(11) Response to Argument

It is noted that claim 1 is a method claim and the bulk of the appellants arguments against the rejection of claim 1 are drawn to the structure of the device. See arguments starting and page 9 and ending on page 10. While the structure is important

to any method of using an invention it is only the method of operation of the references that is in question. In the response to the appellant arguments below the examiner has clarified the structure and methods taught by Swain and Van Breen such that it is clear all limitations of the claims have been met by those references.

In regards to the combination of Swain and Van Breen not teaching moving the rolls by rotation of the roll loading shaft, the examiner contends that limitation is not in claim 1. The limitation in claim 1 is rotating the loading shaft to actuate a mechanism on the roll retaining shaft. Swain meets this limitation of the claim in that the roll retaining shaft has a button (24) on its end that is engaged by the roll loading shaft (110) wherein the button is pressed and rotated to actuate the mechanism (42) that allows the rolls to be moved from the roll retaining shaft. See column 5 lines 26-50 of the Swain reference. As mentioned in the rejection of claim 1 Swain does not teach the step of moving the rolls by a mechanism on the roll retaining shaft. Swain further teaches moving the objects on their retailing roll onto the retaining roll via an end to end contact of the two rolls. The Van Breen reference is cited as a teaching of a mandrel with a plurality of discrete products on it that may be moved as needed by a threaded rod within the mandrel. As such the examiner holds that the combination is proper and would have been obvious to a mechanic skilled in this art.

Regarding appellants arguments that Van Breen does not teach a shaft to shaft transfer of the objects, it is noted that limitation is taught by the primary reference of Swain. The Van Breen reference was applied in the rejection for the reasons stated

above. Again the examiner holds the rejection as being proper in regards to this argument.

In regards to appellants arguments for claim 4, while they follow the arguments for claim 1 the examiner feels a response is warranted at this time. Swain teaches two object handling shafts which are actuated by one roll engaging the end of the second shaft and then transferring the product from shaft to shaft. The engagement features one roll rotating to actuate a mechanism on the second roll to allow the objects to be moved. Van Breen is cited as a secondary reference as it teaches a mechanism on a shaft for moving objects onto and off of said shaft. As swain mentions in column 5 lines 44 and 45 the loading mandrel may be of any suitable design. As such one of ordinary skill in the art would recognize the Van Breen device as a suitable design for moving objects onto and off of a shaft.

Appellant argues for claims 5 and 8-10 based merely on their dependence on claim1 or claim 4, therefore those rejections are held to be valid as well at this time by the examiner.

In short the rejections of claims 1,4,5 and 8-10 are proper in that Swain teaches the motivation for applying a mandrel of a suitable design for moving objects from one shaft to another and Van Breen teaches a mechanism for moving objects on a shaft without needing an outside handling device.

Regarding appellants arguments for claim 11 the examiner notes that Swain does teach transferring objects from one shaft to another and that said transference is actuated by engagement of the two shafts. Swain further teaches the release of the

objects is caused by rotation of the second shaft. Thus Swain does teach the moving mechanism (42) on the roll retaining shaft being actuated by engagement and rotation of the second shaft (110). The appellant offered no arguments to the combination of Read and Swain and the examiner takes that as proof of the validity of the rejection. Since swain teaches the limitations of the claim that Read does not the rejection is held to be valid by the examiner. Claim 12-16 which depend from claim 11 are also held to be valid at this time by the examiner.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600

Charles A. Fox
October 14, 2004

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PATENT ABSTRACTS OF JAPAN

(11)Publication number : **07-034759**

(43)Date of publication of application : **03.02.1995**

(51)Int.Cl. **E06B 3/46**
E06B 7/24
G03D 17/00

(21)Application number : **05-178060**

(22)Date of filing : **19.07.1993**

(71)Applicant : **FUJI PHOTO FILM CO LTD**

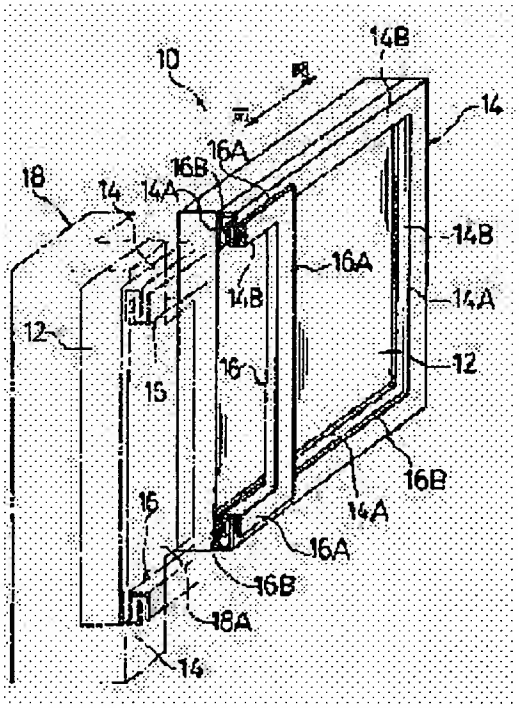
(72)Inventor : **SANO TAKUMI**
NAGANUMA HAJIME
AKATSUKA TAKASHI

(54) NONCONTACT SHADING DOOR DEVICE

(57)Abstract:

PURPOSE: To blockade a dark room with a labyrinthine space in a shading state in the case an opening is blockaded with a shading door and to make the labylabyrinthine space as a noncontact state to maintain vent efficiency.

CONSTITUTION: First recessed rail members 14 are provided at both sides and the rear end of a shading door 12 opening and closing an opening 24 of a dark room 20. Second recessed rail members 16 are provided around the opening 24 corresponding to both sides and the rear end of the shading door 12. In the case the opening 24 is blockaded with the shading door 12, the second recessed rail members 16 are fitted to the first recessed rail members 14 lady rinthically in a noncontact manner. In addition, in the case the opening 24 is blockaded with the shading door 12, a third recessed rail member 18 provided around the opening 24 in correspondence with the front end of the shading door 12 is fitted to the front end of the shading door 12 labyrinthically in a noncontact manner.



LEGAL STATUS

[Date of request for examination] 14.01.1999

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the

examiner's decision of rejection or application converted registration]	
[Date of final disposal for application]	
[Patent number]	3239297
[Date of registration]	12.10.2001
[Number of appeal against examiner's decision of rejection]	
[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	

* NOTICES *

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PRIOR ART

[Description of the Prior Art] A photographic film cuts out a double-width long film to narrow-width, does a punching activity, a piece number quenching activity, etc. at a process after that, is cut to the die length of standard size, and is manufactured, and it is used for them, carrying out the inner package of the manufactured photographic film to a cartridge or a cartridge. And from the cutting process of a long film to the inner package process of a photographic film is performed in a dark room.

[0003] It has the slide shutter of a couple so that this dark room may turn into a dark room of a den for every process in consideration of the case where a trouble occurs, at the processing process mentioned above. The revolution roller is formed in the opposite section of the slide shutter of a couple, and if the slide shutter of a couple is closed, the pressure welding of each revolution roller will be carried out [each other]. Thereby, as for the den by which it was closed with the slide shutter since the revolution roller shaded outdoor daylight for a role of a sealant sure enough, a dark-room condition is maintained (JP,58-107528,A).

[0004] Moreover, when the dark room is equipped with the door, packing generally attached in the perimeter of a door plays a role of a sealant. That is, when using a dark room, a door is closed first, the closed door is forced on the wall of a dark room, and the seal of the clearance between doors is carried out to a wall by packing.

[Translation done.]

JAPANESE [JP,07-034759,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS OPERATION EXAMPLE DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

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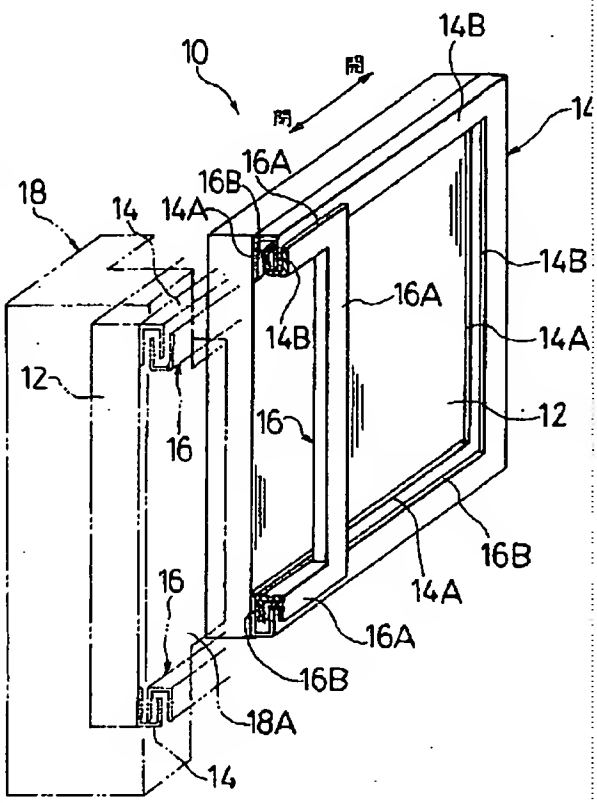
CLAIMS

[Claim(s)]
[Claim 1] The protection-from-light door which is made to slide, and opens and closes dark-room opening, and the 1st concave rail member prepared along with the both-sides section and the back end section of this protection-from-light door, The 2nd concave rail member which counters three sides of the both-sides section of said protection-from-light door, and the back end section, is prepared in the perimeter of said dark-room opening, and carries out labyrinth fitting by non-contact at the concave section of said 1st concave rail member, Non-contact type protection-from-light door equipment equipped with the 3rd concave rail member in which the point of said protection-from-light door carries out labyrinth fitting by non-contact when the point of said protection-from-light door was countered, it was prepared in the perimeter of said dark-room opening and said protection-from-light door blockaded said dark-room opening.

[Translation done.]

Drawing selection
Representative drawing



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EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, when a protection-from-light door blockades dark-room opening according to the non-contact type protection-from-light door equipment concerning this invention, it gears in the shape of non-contact to the 1st concave rail member, and labyrinth-like space is continuously formed in the both-sides section and the back end section between a protection-from-light door and dark-room opening. Furthermore, the point of a protection-from-light door inserts in the concave section of the 3rd concave rail member in the shape of non-contact, and labyrinth-like space is formed in the point between a protection-from-light door and dark-room opening.
[0024] Therefore, when dark-room opening is blockaded at a protection-from-light door, dark-room opening is blockaded by the protection-from-light condition in labyrinth-like space. Moreover, the 1st concave rail member and the 2nd concave rail member are maintained by the non-contact condition, a protection-from-light door and the 3rd concave rail member are further maintained by the non-contact condition, and the permeability of labyrinth-like space is maintained. Thus, since permeability was given as a configuration which can shade without using packing, an oxygen shortage in a dark room can be prevented. Moreover, since it can shade only by moving a protection-from-light door in the direction of a straight line, user-friendliness improves. Since the wear member of packing furthermore is not used, the accidental light leak trouble at the time of wearing packing out is canceled, and generating of troubles, such as product failure, can be prevented.
[0025] Moreover, since reduction-ization of a maintenance sustaining cost is attained since the member [exhausting] is not used, and there is neither a member [exhausting] nor the sliding section, generating of dust can be controlled. And since it is simple structure, reduction of a manufacturing cost can be aimed at. Furthermore, since there is no sliding section, power load becomes small, and the noise decreases. Moreover, since there are few members, lightweight-ization can be attained.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the case of JP,58-107528,A, since the pressure welding of each revolution roller of each other is carried out, each revolution roller is worn out and there is a problem of carrying out a light leak. Moreover, since a door is forced on the wall of a dark room once it closes a door when the dark room is equipped with the door, there is a problem of being user-unfriendly, and like the case where it is JP,58-107528,A, since packing attached in the perimeter of a door is pressed by the wall, it wears out and there is a problem of carrying out a light leak. Furthermore, when packing presses in a wall, there is a problem that permeability is spoiled.
[0006] In order to cancel such a trouble, the protection-from-light door equipped with non-contact type seal structure is known. However, since this non-contact type of protection-from-light door has a clearance between the seals of seal structure, packing is prepared in this clearance and the seal of the clearance is carried out. Therefore, packing prepared in the clearance is worn out and there is a problem of carrying out a light leak.
[0007] This invention was made in view of such a situation, and has permeability, and it is user-friendly and aims at offering the non-contact type protection-from-light door equipment which can prevent the light leak by wear of packing further.

[Translation done.]

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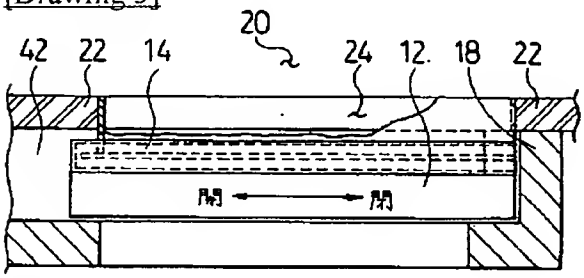
DRAWINGS

[Drawing 3]



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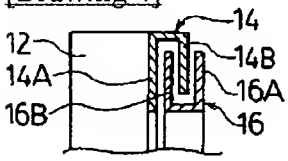

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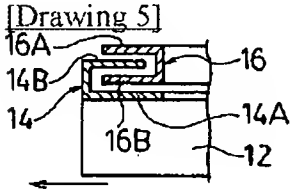

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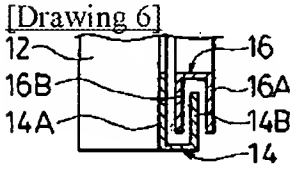

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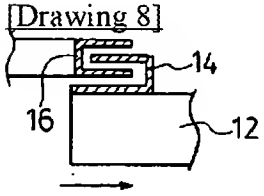

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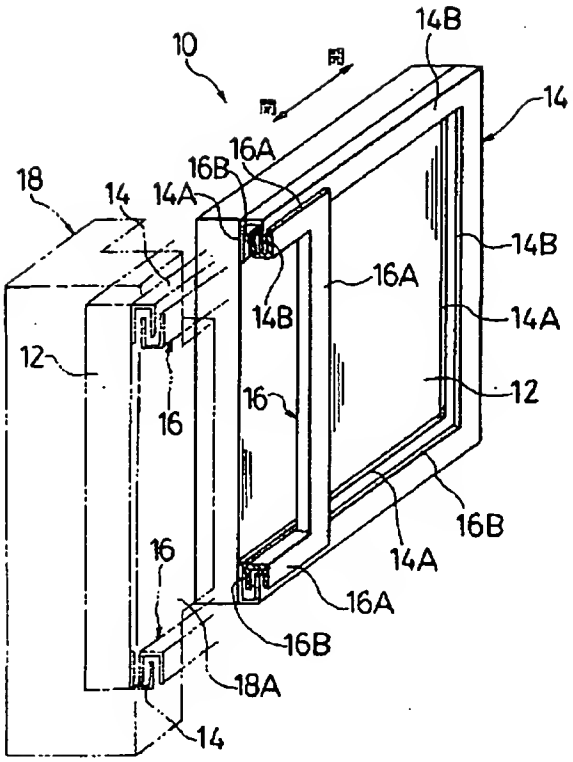

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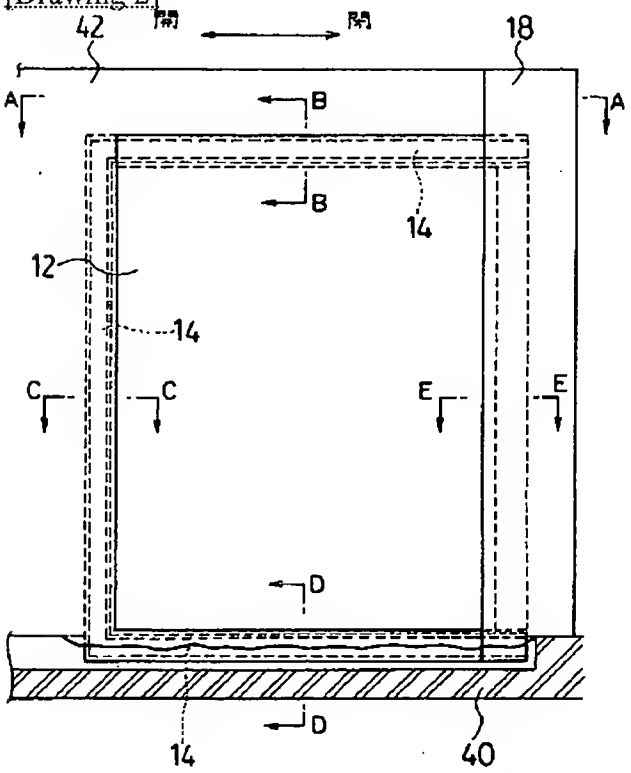

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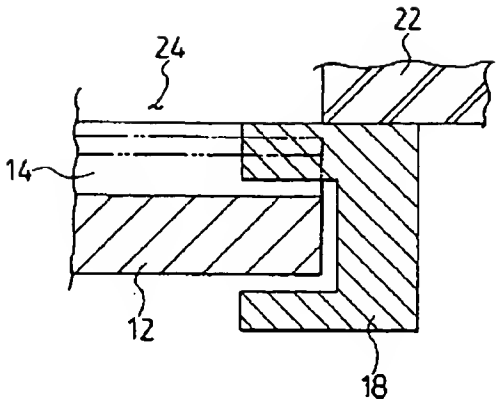

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the non-contact type protection-from-light door equipment which is applied to non-contact type protection-from-light door equipment, especially is made to slide a protection-from-light door in a longitudinal direction or the vertical direction, and opens and closes opening of a dark room.
[0002]
[Description of the Prior Art] A photographic film cuts out a double-width long film to narrow-width, does a punching activity, a piece number quenching activity, etc. at a process after that, is cut to the die length of standard size, and is manufactured, and it is used for them, carrying out the inner package of the manufactured photographic film to a cartridge or a cartridge. And from the cutting process of a long film to the inner package process of a photographic film is performed in a dark room.
[0003] It has the slide shutter of a couple so that this dark room may turn into a dark room of a den for every process in consideration of the case where a trouble occurs, at the processing process mentioned above. The revolution roller is formed in the opposite section of the slide shutter of a couple, and if the slide shutter of a couple is closed, the pressure welding of each revolution roller will be carried out [each other]. Thereby, as for the den by which it was closed with the slide shutter since the revolution roller shaded outdoor daylight for a role of a sealant sure enough, a dark-room condition is maintained (JP,58-107528,A).
[0004] Moreover, when the dark room is equipped with the door, packing generally attached in the perimeter of a door plays a role of a sealant. That is, when using a dark room, a door is closed first, the closed door is forced on the wall of a dark room, and the seal of the clearance between doors is carried out to a wall by packing.
[0005]
[Problem(s) to be Solved by the Invention] However, in the case of JP,58-107528,A, since the pressure welding of each revolution roller of each other is carried out, each revolution roller is worn out and there is a problem of carrying out a light leak. Moreover, since a door is forced on the wall of a dark room once it closes a door when the dark room is equipped with the door, there is a problem of being user-unfriendly, and like the case where it is JP,58-107528,A, since packing attached in the perimeter of a door is pressed by the wall, it wears out and there is a problem of carrying out a light leak. Furthermore, when packing presses in a wall, there is a problem that permeability is spoiled.
[0006] In order to cancel such a trouble, the protection-from-light door equipped with non-contact type seal structure is known. However, since this non-contact type of protection-from-light door has a clearance between the seals of seal structure, packing is prepared in this clearance and the seal of the clearance is carried out. Therefore, packing prepared in the clearance is worn out and there is a problem of carrying out a light leak.
[0007] This invention was made in view of such a situation, and has permeability, and it is user-friendly and aims at offering the non-contact type protection-from-light door equipment which can prevent the light leak by wear of packing further.
[0008]
[Means for Solving the Problem] The protection-from-light door which is made to slide this invention in order to attain said object, and opens and closes dark-room opening, The 1st concave rail member prepared along with the both-sides section and the back end section of this protection-from-light door, The 2nd concave rail member which counters three sides of the both-sides section of said protection-from-light door, and the back end section, is prepared in the perimeter of said dark-room opening, and carries out labyrinth fitting by non-contact at the concave section of said 1st concave rail member, When the point of said protection-from-light door is countered, it is prepared in the perimeter of said dark-room opening and said protection-from-light door blockades said dark-room opening, the point of said protection-

from-light door is characterized by having the 3rd concave rail member which carries out labyrinth fitting by non-contact.

[0009]

[Function] According to this invention, the 1st concave rail member was prepared along with the both-sides section and the back end section of a protection-from-light door which are made to slide to a longitudinal direction, and open and close dark-room opening. Moreover, the perimeter of dark-room opening was made to correspond to the both-sides section and the back end section of a protection-from-light door, and the 2nd concave rail member was prepared in it. When a protection-from-light door blockades dark-room opening, the 2nd concave rail member gears in the shape of non-contact to the 1st concave rail member, and forms labyrinth-like space in the both-sides section and the back end section between a protection-from-light door and dark-room opening continuously. Furthermore, the point of a protection-from-light door was made to correspond to the perimeter of dark-room opening, and the 3rd concave rail member was prepared in it. When a protection-from-light door blockades opening of a dark room in the concave section of the 3rd concave rail member, the point of a protection-from-light door inserts in the shape of non-contact, and forms labyrinth-like space in the point between a protection-from-light door and dark-room opening.

[0010] Therefore, when dark-room opening is blockaded at a protection-from-light door, dark-room opening is blockaded by the protection-from-light condition in labyrinth-like space. Moreover, since the 1st concave rail member and the 2nd concave rail member are maintained by the non-contact condition in this case and a protection-from-light door and the 3rd concave rail member are further maintained by the non-contact condition, the permeability of labyrinth-like space is maintained.

[0011] It explains in full detail about the non-contact type protection-from-light door equipment applied to this invention according to an accompanying drawing below. The perspective view of the non-contact type protection-from-light door equipment which drawing 1 requires for this invention, the front view of the non-contact type protection-from-light door equipment which drawing 2 requires for this invention, and drawing 3 are the A-A view drawing. Non-contact type protection-from-light door equipment 10 is equipped with the protection-from-light door 12, the 1st concave rail member 14, the 2nd concave rail member 16, and the 3rd concave rail member 18. The protection-from-light door 12 is formed in the shape of a rectangle, and is supported by the wall 22 (refer to drawing 3) of a dark room 20 free [the slide to a longitudinal direction]. When opening of the opening 24 of a dark room 20 will be carried out if it slides leftward on drawing 3 , and the protection-from-light door 12 slides rightward, the opening 24 of a dark room 20 is blockaded.

[0012] Along with the upper bed section, the soffit section, and the back end section, the 1st concave rail member 14 of an abbreviation KO typeface is attached in the side face of the protection-from-light door 12. As shown in drawing 1 , the cross section of the 1st concave rail member 14 is formed in the abbreviation KO typeface, and one-side 14A of this abbreviation KO typeface is attached in the upper bed section, the soffit section, and the back end section of a side face of the protection-from-light door 12. Moreover, along with the upper bed section, the soffit section, and the back end section of opening 24 of a dark room 20, the 2nd concave rail member 16 of an abbreviation KO typeface is formed. The cross section of the 2nd concave rail member 16 is formed in the abbreviation KO typeface like the cross section of the 1st concave rail member 14.

[0013] One-side 16A of the abbreviation KO typeface of the 2nd concave rail member 16 is attached in the upper bed section, the soffit section, and the back end section of opening 24 of a dark room 20. And the physical relationship of the 2nd concave rail member 16 and the 1st concave rail member 14 After the protection-from-light door 12 has blockaded the opening 24 of a dark room 20, other side 16B of the abbreviation KO typeface of the 2nd concave rail member 16 is inserted in the crevice of the 1st concave rail member 14. Other side 14B of the abbreviation KO typeface of the 1st concave rail member 14 is inserted in the crevice of the 2nd concave rail member 16 (refer to drawing 4 thru/or drawing 6). Thereby, when the protection-from-light door 12 blockades the opening 24 of a dark room 20, labyrinth-like space is continuously formed in the upper bed section, the soffit section, and the back end section between the protection-from-light door 12 and opening 24 by the 1st concave rail member 14 and the 2nd concave rail member 16.

[0014] Furthermore, the 3rd concave rail member 18 is attached in the point of the opening 24 of a dark room 20. The cross section is formed in the abbreviation KO typeface, and, as for the 3rd concave rail member 18, the one-side 18A is attached in the point of opening 24. And after the protection-from-light door 12 has blockaded the opening 24 of a dark room 20, the point of the protection-from-light door 12 inserts in the crevice of the 3rd concave rail member 18 (refer to drawing 7). This forms labyrinth-like space in the point between the protection-from-light door 12 and opening 24 by the protection-from-light door 12 and the 3rd concave rail member 18.

[0015] An operation of the non-contact type protection-from-light door equipment concerning constituted this

invention is explained like the above. First, if the protection-from-light door 12 moves in the direction which releases the opening 24 of a dark room 20, the 1st concave rail member 14 of the back end section of the protection-from-light door 12 will move in the direction which separates from the 2nd concave rail member 16 of the back end section of opening 24. Therefore, other side 14B of the abbreviation KO typeface of the 2nd concave rail member 16 slips out [other side 14B of the abbreviation KO typeface of the 1st concave rail member 14] from the inside of the crevice of the 1st concave rail member 14 to ejection and a pan out of the crevice of the 2nd concave rail member 16. Simultaneously, the point of the protection-from-light door 12 slips out from the crevice of the 3rd concave rail member 18. Thereby, the protection-from-light door 12 is movable to the location which releases the opening 24 of a dark room 20.

[0016] Next, if the protection-from-light door 12 moves in the direction which blockades the opening 24 of a dark room 20, the 1st concave rail member 14 of the back end section of the protection-from-light door 12 will move in the direction approaching the 2nd concave rail member 16 of the back end section of opening 24. Therefore, other side 14B of the abbreviation KO typeface of the 1st concave rail member 14 inserts in the crevice of the 2nd concave rail member 16, and other side 14B of the abbreviation KO typeface of the 2nd concave rail member 16 inserts in the crevice of the 1st concave rail member 14 further. Simultaneously, the point of the protection-from-light door 12 inserts in the crevice of the 3rd concave rail member 18.

[0017] Thereby, labyrinth-like space is continuously formed in the upper bed section, the soffit section, and the back end section between the protection-from-light door 12 and opening 24 by the 1st concave rail member 14 and the 2nd concave rail member 16, and labyrinth-like space is simultaneously formed in the point between the protection-from-light door 12 and opening 24 by the protection-from-light door 12 and the 3rd concave rail member 18. Therefore, opening 24 is blockaded by the protection-from-light condition only by moving the protection-from-light door 12 to a longitudinal direction. Moreover, the 1st concave rail member 14 and the 2nd concave rail member 16 are maintained by the non-contact condition in this case, and the protection-from-light door 12 and the 3rd concave rail member 18 are further maintained by the non-contact condition. Therefore, as for a dark room 20, permeability with the exterior is maintained.

[0018]

[Example] A dark room 20 is 2000mm in width of face of 4200mm, height of 3000mm, and depth, and formed the protection-from-light door 12 with width of face of 2600mm, a height [of 2500mm], and a thickness of 50mm in the front face of this dark room 20. The protection-from-light door 12 considered construction material as SS41 and white paint finishing by the right-and-left sliding door of an actuation type with up suspension structure.

[0019] Labyrinth width of face of 40mm (10mmx4), a labyrinth depth of 60mm (50mm of laps), and construction material were considered as SUS304 with a thickness of 1mm and black lusterless paint finishing. When the color photography photographic paper which the optical power meter inside a dark room 20 did not respond where the protection-from-light door 12 is shut, but was left inside [eight] the dark room 20 for 70 hours was developed, there was no fogging.

[0020]

[Comparative Example(s)] It considered as a labyrinth depth of 20mm (10mm of laps), and when others considered as an example and these conditions, there is an optical leak of 110hW(s) (it measures with 580mm light power meter) in the direction of the interior of a dark room 20 by **** for 400lux 10 minutes, and the fogging was accepted in some color photography photographic paper put on the eight interior of a dark room 20 (development assessment).

[0021] Although said example explained the case where it applied to the protection-from-light door 12 which moves the non-contact type protection-from-light door equipment concerning this invention to a longitudinal direction, it is applicable similarly [in the case of the protection-from-light door which moves horizontally / not only this but in the case of the protection-from-light door which moves in the vertical direction].

* NOTICES *

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OPERATION

[Function] According to this invention, the 1st concave rail member was prepared along with the both-sides section and the back end section of a protection-from-light door which are made to slide to a longitudinal direction, and open and close dark-room opening. Moreover, the perimeter of dark-room opening was made to correspond to the both-sides section and the back end section of a protection-from-light door, and the 2nd concave rail member was prepared in it. When a protection-from-light door blockades dark-room opening, the 2nd concave rail member gears in the shape of non-contact to the 1st concave rail member, and forms labyrinth-like space in the both-sides section and the back end section between a protection-from-light door and dark-room opening continuously. Furthermore, the point of a protection-from-light door was made to correspond to the perimeter of dark-room opening, and the 3rd concave rail member was prepared in it. When a protection-from-light door blockades opening of a dark room in the concave section of the 3rd concave rail member, the point of a protection-from-light door inserts in the shape of non-contact, and forms labyrinth-like space in the point between a protection-from-light door and dark-room opening.
[0010] Therefore, when dark-room opening is blockaded at a protection-from-light door, dark-room opening is blockaded by the protection-from-light condition in labyrinth-like space. Moreover, since the 1st concave rail member and the 2nd concave rail member are maintained by the non-contact condition in this case and a protection-from-light door and the 3rd concave rail member are further maintained by the non-contact condition, the permeability of labyrinth-like space is maintained.
[0011] It explains in full detail about the non-contact type protection-from-light door equipment applied to this invention according to an accompanying drawing below. The perspective view of the non-contact type protection-from-light door equipment which drawing 1 requires for this invention, the front view of the non-contact type protection-from-light door equipment which drawing 2 requires for this invention, and drawing 3 are the A-A view drawing. Non-contact type protection-from-light door equipment 10 is equipped with the protection-from-light door 12, the 1st concave rail member 14, the 2nd concave rail member 16, and the 3rd concave rail member 18. The protection-from-light door 12 is formed in the shape of a rectangle, and is supported by the wall 22 (refer to drawing 3) of a dark room 20 free [the slide to a longitudinal direction]. When opening of the opening 24 of a dark room 20 will be carried out if it slides leftward on drawing 3 , and the protection-from-light door 12 slides rightward, the opening 24 of a dark room 20 is blockaded.
[0012] Along with the upper bed section, the soffit section, and the back end section, the 1st concave rail member 14 of an abbreviation KO typeface is attached in the side face of the protection-from-light door 12. As shown in drawing 1 , the cross section of the 1st concave rail member 14 is formed in the abbreviation KO typeface, and one-side 14A of this abbreviation KO typeface is attached in the upper bed section, the soffit section, and the back end section of a side face of the protection-from-light door 12. Moreover, along with the upper bed section, the soffit section, and the back end section of opening 24 of a dark room 20, the 2nd concave rail member 16 of an abbreviation KO typeface is formed. The cross section of the 2nd concave rail member 16 is formed in the abbreviation KO typeface like the cross section of the 1st concave rail member 14.
[0013] One-side 16A of the abbreviation KO typeface of the 2nd concave rail member 16 is attached in the upper bed section, the soffit section, and the back end section of opening 24 of a dark room 20. And the physical relationship of the 2nd concave rail member 16 and the 1st concave rail member 14 After the protection-from-light door 12 has blockaded the opening 24 of a dark room 20, other side 16B of the abbreviation KO typeface of the 2nd concave rail member 16 is inserted in the crevice of the 1st concave rail member 14. Other side 14B of the abbreviation KO typeface of the 1st concave rail member 14 is inserted in the crevice of the 2nd concave rail member 16 (refer to drawing 4 thru/or drawing 6). Thereby, when the protection-from-light door 12 blockades the opening 24 of a dark room 20, labyrinth-like space is continuously formed in the upper bed section, the soffit section, and the back end

section between the protection-from-light door 12 and opening 24 by the 1st concave rail member 14 and the 2nd concave rail member 16.

[0014] Furthermore, the 3rd concave rail member 18 is attached in the point of the opening 24 of a dark room 20. The cross section is formed in the abbreviation KO typeface, and, as for the 3rd concave rail member 18, the one-side 18A is attached in the point of opening 24. And after the protection-from-light door 12 has blockaded the opening 24 of a dark room 20, the point of the protection-from-light door 12 inserts in the crevice of the 3rd concave rail member 18 (refer to drawing 7). This forms labyrinth-like space in the point between the protection-from-light door 12 and opening 24 by the protection-from-light door 12 and the 3rd concave rail member 18.

[0015] An operation of the non-contact type protection-from-light door equipment concerning constituted this invention is explained like the above. First, if the protection-from-light door 12 moves in the direction which releases the opening 24 of a dark room 20, the 1st concave rail member 14 of the back end section of the protection-from-light door 12 will move in the direction which separates from the 2nd concave rail member 16 of the back end section of opening 24. Therefore, other side 14B of the abbreviation KO typeface of the 2nd concave rail member 16 slips out [other side 14B of the abbreviation KO typeface of the 1st concave rail member 14] from the inside of the crevice of the 1st concave rail member 14 to ejection and a pan out of the crevice of the 2nd concave rail member 16. Simultaneously, the point of the protection-from-light door 12 slips out from the crevice of the 3rd concave rail member 18. Thereby, the protection-from-light door 12 is movable to the location which releases the opening 24 of a dark room 20.

[0016] Next, if the protection-from-light door 12 moves in the direction which blockades the opening 24 of a dark room 20, the 1st concave rail member 14 of the back end section of the protection-from-light door 12 will move in the direction approaching the 2nd concave rail member 16 of the back end section of opening 24. Therefore, other side 14B of the abbreviation KO typeface of the 1st concave rail member 14 inserts in the crevice of the 2nd concave rail member 16, and other side 14B of the abbreviation KO typeface of the 2nd concave rail member 16 inserts in the crevice of the 1st concave rail member 14 further. Simultaneously, the point of the protection-from-light door 12 inserts in the crevice of the 3rd concave rail member 18.

[0017] Thereby, labyrinth-like space is continuously formed in the upper bed section, the soffit section, and the back end section between the protection-from-light door 12 and opening 24 by the 1st concave rail member 14 and the 2nd concave rail member 16, and labyrinth-like space is simultaneously formed in the point between the protection-from-light door 12 and opening 24 by the protection-from-light door 12 and the 3rd concave rail member 18. Therefore, opening 24 is blockaded by the protection-from-light condition only by moving the protection-from-light door 12 to a longitudinal direction. Moreover, the 1st concave rail member 14 and the 2nd concave rail member 16 are maintained by the non-contact condition in this case, and the protection-from-light door 12 and the 3rd concave rail member 18 are further maintained by the non-contact condition. Therefore, as for a dark room 20, permeability with the exterior is maintained.

[Translation done.]

EXAMPLE

[Example] A dark room 20 is 2000mm in width of face of 4200mm, height of 3000mm, and depth, and formed the protection-from-light door 12 with width of face of 2600mm, a height [of 2500mm], and a thickness of 50mm in the front face of this dark room 20. The protection-from-light door 12 considered construction material as SS41 and white paint finishing by the right-and-left sliding door of an actuation type with up suspension structure.
[0019] Labyrinth width of face of 40mm (10mmx4), a labyrinth depth of 60mm (50mm of laps), and construction material were considered as SUS304 with a thickness of 1mm and black lusterless paint finishing. When the color photography photographic paper which the optical power meter inside a dark room 20 did not respond where the protection-from-light door 12 is shut, but was left inside [eight] the dark room 20 for 70 hours was developed, there was no fogging.
[0020]
[Comparative Example(s)] It considered as a labyrinth depth of 20mm (10mm of laps), and when others considered as an example and these conditions, there is an optical leak of 110hW(s) (it measures with 580mm light power meter) in the direction of the interior of a dark room 20 by **** for 400lux 10 minutes, and the fogging was accepted in some color photography photographic paper put on the eight interior of a dark room 20 (development assessment).
[0021] Although said example explained the case where it applied to the protection-from-light door 12 which moves the non-contact type protection-from-light door equipment concerning this invention to a longitudinal direction, it is applicable similarly [in the case of the protection-from-light door which moves horizontally / not only this but in the case of the protection-from-light door which moves in the vertical direction]. And although the "both ends" in a claim meant "a up edge and the soffit section" in the example, in the case of a vertical sliding door and a horizontal sliding window, "both ends" will mean "the left end section and a right edge."
[0022] In addition, 40 is a floor on drawing 2 and 42 is a door pocket which contains the protection-from-light door 12. Although it is not necessary to use a door pocket 42, much more protection-from-light effectiveness can be acquired by attaching a door pocket 42. Moreover, since the structure of reverse is possible in a selfish difference, the relation between a point and the back end section corresponds to the technical range of this invention, also when the structure of the part equivalent to drawing 5 becomes like drawing 8 .

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The perspective view of the non-contact type protection-from-light door equipment concerning this invention
[Drawing 2] The front view of the non-contact type protection-from-light door equipment concerning this invention
[Drawing 3] The A-A sectional view of drawing 2
[Drawing 4] The B-B sectional view of drawing 2
[Drawing 5] The C-C sectional view of drawing 2
[Drawing 6] The D-D sectional view of drawing 2
[Drawing 7] The E-E sectional view of drawing 2
[Drawing 8] The sectional view of the selfish difference structure equivalent to drawing 5
[Description of Notations]
10 -- Non-contact type protection-from-light door equipment
12 -- Protection-from-light door
14 -- 1st concave rail member
16 -- 2nd concave rail member
18 -- 3rd concave rail member
20 -- Dark room
24 -- Opening

[Translation done.]